

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 362: WIRELESS AND MOBILE COMPUTING

STREAMS: BSC (COMP. SCI) Y3S2

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 10/4/2019

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS

1. Attempt **question 1** and any other **TWO** from SECTION B
2. Marks are awarded for clear and concise answers
3. ONLY the first **THREE** Questions attempted will be marked (**Question one inclusive**)

SECTION A-COMPULSORY

Question ONE [30 Marks]

- (a) What are the key features and design goals of the following cellular systems?
- (i) 1G [3 Marks]
 - (ii) 2G [3 Marks]
 - (iii) 3G [3 Marks]
 - (iv) 4G [3 Marks]
- (b) What do you understand from the term applications store? Give TWO examples of application stores in use today [4 Marks]
- (c) What is the effect of the following on a radio frequency signal?
- (i) Forest [2 Marks]
 - (ii) Concrete in a storey building [2 Marks]
 - (iii) Very tall building between the sender and receiver [2 Marks]
- (d) Specify the functions of the Equipment identity register (EIR) and Home location register in both GSM and GPRS network [4 Marks]
- (e) Describe the concept of Mobile IP in relation to mobile computing [4 Marks]

SECTION B- ANSWER ANY TWO QUESTIONS FROM THIS SECTION

Question TWO [20 Marks]

- (a) Describe the following mechanisms used to enable multiple use of a shared medium in mobile communication. Give **ONE** advantage and **ONE** disadvantage of each access mechanism.
- (i) FDMA [5 Marks]
 - (ii) TDMA [5 Marks]
 - (iii) CDMA [5 Marks]
- (b) Describe virtual circuit switching mechanism. Give one advantages and one disadvantage of this switching mechanism [5 Marks]

Question THREE [20 Marks]

- (a) Explain **FIVE** design goals of 5G cellular networks [5 Marks]
- (b) What are the key functions of the following components of WAP protocol stack:
- (i) Wireless Application Environment [4 Marks]
 - (ii) Wireless Session Protocol [4 Marks]
 - (iii) Wireless Transaction Protocol [4 Marks]
- (c) Wireless networks are characterised by a number of limitations. While stating their effect to performance, describe **THREE** limitations [3 Marks]

Question FOUR [20 Marks]

- (a) Using a diagram illustrate the architecture of GPRS system [15 Marks]
- (b) What are the key distinguishing features of GSM and GPRS [5 Marks]

Question FIVE [20 Marks]

- (a) Give **TWO** advantages and **TWO** disadvantages of cross platform mobile development [4 Marks]
- (b) While describing what RFID technology is, describe **TWO** of its categories [6 Marks]
- (c) What is the role of Wireless Datagram Protocol (WDP) of the WAP protocol stack [4 Marks]
- (d) Congestion control is a common problem in computer networks. Describe **THREE** factors that cause congestion [6 Marks]